

at all seasons as similar, entirely ignoring the observations of earlier writers many of whom show that some males at least are attired in a modified nuptial garb. Blanford, in "The Fauna of British India"—Birds., Vol. IV, p. 200, begins: "*Coloration. Female* (and, according to some, male in winter plumage)", evidently holding an opinion different from that expressed by Oates. He then describes the male in breeding plumage, and remarks later: "The black plumage of the male is acquired by a moult, and is retained partly or wholly by some birds in the winter; but in others, probably younger, it appears to be replaced by the ordinary garb of the female" and quotes Blyth as having witnessed this latter change in birds kept in confinement. Hume and Marshall in "The Game Birds of India, Burmah and Ceylon," Vol. 1, pp. 24 and 25, say: "Young males, up to the beginning of March, entirely resemble the females, but the moult then commencing gradually assimilates them to the adults, which never lose, . . . the striking black and white garb that . . . is proper to the male sex." Later on this remark appears to me to be contradicted by the following:—"Two young but full grown, or nearly full grown, males before me, shot in January, have the black bodies and white wings of the adult, but the heads and necks are like those of the females."

I have just had an opportunity of examining a pair of these birds shot in the Kheri District, Oudh, on January 31st, 1905. The female needs no remarks, but the male, very dissimilar in its livery, nearly agrees with the two males just quoted from Hume and Marshall. I made the following observations. ♂ Length $27\frac{1}{2}$ ", wing $13\frac{1}{4}$ ", tarsus $5\frac{1}{2}$ "

Plumage, except the wing and under parts, as in the female. The 1st quill is blackish brown with whitish fulvous mottling in bars on the inner web. The 2nd quill deep black at tip and on the outer web, pure white on inner web. 3rd, 4th, 5th and 6th quills pure white tipped black. The 7th and 8th quills blackish-brown beautifully marbled in whitish bars. The 9th and 10th quills pure white with black tips. All shafts black throughout.

The secondaries are pure white except the basal $\frac{3}{4}$ — $\frac{4}{5}$ th of the shafts which are black, and the inner webs which are progressively increasingly black from without inwards from their bases, the whole web being black in the innermost three.

The upper coverts are white mottled fulvous, the 7th and 8th greater coverts coloured like the corresponding quills. The lower plumage, including that on the thighs, is black up to the lower part of the breast, except the greater primary coverts which are pure white basally. The measurements of the female are—Length $29\frac{1}{2}$ ", wing 14 ", tarsus 6 ".

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FYZABAD, February 5th, 1905.

NO. XXIV.—NOTES ON SOME BANGALORE SNAKES.

A two months' holiday in Bangalore during August and September, 1904, furnished me with the following notes on some species common in that locality:—

Tropidonotus piscator.—The Canarese name for this species is *neer hāvu* which equals "water-snake." I witnessed one instance of the extreme

ferocity of this notably fierce snake. Two *sampwallahs* had a specimen, among others, which they displayed for my benefit. This specimen fastened itself on to the great toe of one man who was sitting tailor-fashion, and it was only by prizing open the creature's mouth with considerable force that it could be made to release its hold, and almost at once it fastened itself again on to the man's leg, requiring a repetition of the same violent measures. Blood oozed fairly freely from both wounds.

Tropidonotus stolatus.—A small one measuring $7\frac{1}{2}$ " was brought to me on the 29th of September.

Macropisthodon plumbicolor.—The "*hässaru hävu*" or "green snake" of the Canarese.

This is evidently a very common snake about Bangalore, though Nicholson does not mention it as such in his list on page 175 of "Indian Snakes." It is as timid and gentle as the next species, allowing itself to be freely handled at all times. Like the next species, too, it flattens itself under excitement. One I had in captivity for some months fed voraciously on frogs. The eggs evidently hatch about August and September as will be seen from the following list. The two specimens mentioned under the date 29th of October were found together and were, therefore, probably just hatched from the same clutch of eggs.

Date.	Sex.	Length.	Tail.	Ventrals.	Sub-caudals.	Loreal.	Preoculars.	SCALES.			REMARKS.
								2 heads lengths behind head.	Midbody.	2 heads lengths before vent.	
Aug. 29th	?	6"	$\frac{2}{3}$ "	153	43	0	2	23	25	19	2 postoculars on left side. 15 ventrals between navel and anal shield.
"	?	$6\frac{1}{4}$ "	$\frac{1}{16}$ "	157	37	1(R)	2	23	23	17	18 ventrals between navel and anal shields. Last 3 subcaudals entire.
Sep. 2, 9th	♀	$5\frac{3}{8}$ " $6\frac{1}{8}$ "	$\frac{3}{4}$ " $\frac{1}{16}$ "	Mutilated.
10th	♀	$2'0\frac{1}{2}$ "	$3\frac{11}{16}$ "	153	41	1	2	21	23	16	$\frac{1}{3}$ " \times $\frac{1}{6}$ "—4. Postoculars on right side.
16th	...	Adult	...	152	?	0	2	23	23	17	A slough found emerging from hole in bathroom.
?	149	42	1	2	25	25	19	Hatchling with no date in private collection.
?	♀	153	34	0	2	23	25	17	An adult in Bangalore Museum.

The posterior sublinguals touch 3 infralabials 4th, 5th and 6th, or 5th, 6th and 7th. The 6th or 7th of the infralabial series constitutes the *pentagonal* which is broader than the posterior sublinguals, and in contact with 3 scales posteriorly. Keels in both sexes are present in all rows of scales, to the tip of the tail, excepting the ultimate row for a variable extent in the forepart of the body.

Helicops schistosus.—This is evidently a very common snake in this locality, as every *sampallah* had some, and could procure them in numbers to order. The rule that the females in snakes are larger than the males, is certainly exemplified in this species. It is of a very inoffensive disposition, never attempting to bite, though some of my specimens had ample provocation. At one spot in the Hotel garden the grass beneath some trees was long, and all my specimens when liberated invariably made for this patch about 10 to 15 yards distant. No matter how often they were brought back into the open, they repeated their endeavours, and though frustrated, never tried to bite me when effecting their recapture. They would glide under or over such obstacles as a handkerchief placed and flourished in their way, or through or over my feet, in preference to taking a more circuitous direction to avoid them. In motion they slightly erect the head, and move briskly and fast. When alarmed they erect the head, and flatten the body down to the vent, to a very remarkable degree, far more so than any other snake I know. This flattening is more evident in the females, and I witnessed it most often when they were disturbed in opening their box. At liberty they behave similarly, but they strive to escape so hurriedly that one has not the same opportunity of observing this peculiarity. The eye is rotated more actively, and to a degree I have never witnessed in other species, and to this it owes its very appropriate generic name *Helicops* (Gk. *Helikos*=rolling, *ops* eye). Though so common the *sampallahs* had no vernacular name for it. They all told me it frequented the bamboos in the Lal Bagh, and many of the specimens were caught on the bamboo vegetation some feet from the ground. They denied its frequenting water, which surprised me, for the high-placed, slit-like nostrils proclaim its aquatic tastes.

Three specimens were brought to me on the 27th August—2 males and 1 female; all were captured lying on the same bamboo stem about 10 feet from the ground. Two of these were observed to be "in copula" at about 5 p.m. on the 26th, and a futile attempt at capture made, which was not pressed, the men fearing that the pair might disengage, and jeopardise their chance of obtaining my reward of five rupees. Another and a successful attempt was made on the morning of the 27th, and strange to say the snakes were produced from a cloth at about 11 a.m. still united. I carefully investigated the conjunction on several occasions, being favoured by the docile nature of the species, and their lengthy union, which lasted, without intermission (so far as I am aware), until some time after 12-30 p.m. on the 28th idem.

Subsequent to this no repetition of the act was witnessed. During the time I had them under observation (25½ hours) the left clasper of the male, and this only was engaged with the right orifice of the female, and this leads one to speculate whether, as certainly appears physically possible, two males may sometimes serve one female or *vice versa*. If disturbed, beyond the flattening of the body already referred to and the spasmodic protrusions of the tongue, no alarm was displayed, and no malice offered. Both parties were equally undemonstrative rarely evincing any movement, and then only altering their position somewhat; they did not lie coiled in one another's embraces, nor wreath their tails round one another as I have heard related of other snakes under similar conditions. The ventral apposition was so limited that nobody looking at them would have suspected their sexual relationship. The male was killed on the 2nd September, but the female survived until the 23rd of January 1905. Upon investigation 11 follicles in one ovary and 7 in the other were slightly larger ($\frac{1}{3}$ inch long), and more opaque and yellow than the rest. During the whole of her incarceration she refused all food, and the impaired vitality consequent upon this, augmented by the colder climate of Fyzabad, probably occasioned the arrest of normal developments, and it will be observed that in the female specimen of the last species, which had been in captivity since the 10th of September and died on the 16th February, follicles were evidently impregnated, but their development similarly interfered with. No male snake had been in company with this specimen within the above dates.

The following scale characteristics have escaped notice, or not met with the attention they deserve. The *lower temporal* shield touches 3 supralabials, *viz.*, the 6th, 7th and 8th. The *posterior sublinguals* touch three infralabials, *viz.*, the 5th, 6th and 7th, as in most of the genus *Tropidonotus*. The 7th of the infralabial series is the *pentagonal* and is broader than the posterior sublinguals, and in contact with 3 scales behind, as in most *Tropidonoti*. The *scales* anteriorly number 19, midbody 19 or 17, and posteriorly 17. The step where the reduction takes place occurs very near the middle of the body, sometimes before, but more often after this point. The reduction is effected by the absorption of the 4th row above the ventrals into the row above or below. I paid careful attention to the keels in the sexes, and could discover no accentuation of this condition in the male sex, confirming similar observations in many other species. The keels are absent in from 2—4 rows anteriorly (two heads-lengths behind the head), 2 rows in mid-body, and from 0-2 rows in the posterior body (2 heads-lengths in front of the vent), and cease in the median rows where the supracaudals number four. The red line running along the confines of the 5th and 6th rows above the ventrals (where the scales are 19) and the 4th and 5th rows (where the scales are 17) is much more conspicuous in the males.

The tongue is dull blue black.

The penis is studded with tentacles from base to tip.

Date.	Sex.	Length.	Tail.	Ventrals.	Subcaudals.	SCALES.			REMARKS.
						2 heads-lengths after head.	Midbody.	2 heads-lengths before vent.	
Aug.									
26th	♀	2' 6 $\frac{1}{2}$ "	7 $\frac{1}{2}$ "	149	69	19	19	17	2 postoculars on right side. Died in captivity 14th January 1905.
27th	♀	2' 6 $\frac{1}{2}$ "	6 $\frac{1}{2}$ "	148	64	19	19	17	Died in captivity 23rd January 1905.
27th	♂	1' 9 $\frac{1}{2}$ "	6 $\frac{1}{4}$ "	144	80	19	19	17	
27th	♀	1' 11 $\frac{3}{4}$ "	7"	142	77?	19	19·17	17	Tail incomplete.
28th	♀	1' 9 $\frac{3}{8}$ "	4 $\frac{3}{4}$ "	147	64	19	19·17	17	
28th	♂	1' 4 $\frac{1}{2}$ "	4 $\frac{3}{4}$ "	144	81	19	19	17	
28th	♂	1' 3 $\frac{3}{4}$ "	?	144	?	19	19	17	Tail incomplete.
Sept. 4th	♀	2' 3 $\frac{1}{2}$ "	5 $\frac{1}{2}$ "	148	65	19	17	17	Labials 8, the 4th touching the eye on left side occasioned by confluence of normal 4th and 5th. 5th infralabial subdivided both sides.
4th	♂	1' 5 $\frac{1}{4}$ "	5"	140	80	19	19·17	17	Internasal partially divided behind mesially.
4th	♀	1' 9 $\frac{3}{8}$ "	5"	148	67	19	19	17	
4th	♂	1' 3"	5 $\frac{3}{8}$ "	146	82	19	19	17	Internasal partially divided behind mesially.
4th	♂	1' 9 $\frac{3}{4}$ "	6 $\frac{1}{4}$ "	139	78	19	19	17	
4th	♂	1' 11"	6 $\frac{3}{4}$ "	143	79	19	19	17	

Zamenis mucosus.—A *sampallah* on the 20th August brought one freshly caught, and about 5 $\frac{1}{2}$ feet in length. This when liberated attacked his mongoose with great courage and determination, and inflicted a bite. When separated it compressed its neck, and uttered that peculiar scolding sound I have referred to in other notes in this Journal upon this 'snake. Another specimen was sent to me dead, and measured 7 feet 4 $\frac{1}{2}$ inches. It was a male. I measured the slough of one in the Bangalore museum which had just been presented, and found it taped 9 feet 1 $\frac{1}{2}$ inches, the tail being 2 feet 7 $\frac{1}{2}$ inches. Though I have heard of larger specimens this is much the largest measurement of this species I have personally become acquainted with, and this allowing for considerable reduction for the stretching the slough undergoes. A native official in the museum told me this snake is eaten by the Tigala caste of Tamils, and he called a man of this caste employed in the garden. From him I elicited the following information. He told me the snake is called by them "*Jair*

potoo" which I am informed is Canarese "jair" centipede, and "potoo" animal. (Rice in his work on Mysore, Vol. 1, p. 188, gives "kere" as a Canarese name for this species.) It is much esteemed by them as food, and is reputed of excellent benefit in the wasting of certain diseases. These people having skinned and cleaned it, cut off about 4 inches from the head and about the same length in front of the vent. The rest is cut up into pieces, and cooked, the flesh resembling chicken in colour and taste.

The same man told me water snakes, cobras, and other poisonous snakes were disdained by his caste, and that none of the organs—bile, fat or other parts—entered into their dietary, or medicines.

Coleber helena.—A nice little specimen was brought to me alive on the 6th September which I killed on the 9th. Length 2' 2 $\frac{7}{8}$ "', tail 6 $\frac{1}{4}$ ". Ventrals 231, subcaudals 94. It was an active restless little creature, and when teased showed fight, by erecting and throwing its anterior body into broad sigmoid curves which it straightened in the act of striking. It struck out repeatedly, and in an upward direction much like *Zamenis mucosus*. Prior to striking when poised ready for action, the neck was markedly compressed, and at the same time the throat pouched and vertebral region correspondingly arched, exactly as in *Zamenis mucosus*. The skin between the scales was brought well into view, and was pinkish blue coloured, giving the reptile a very strikingly handsome appearance.

Dryophis mycterizans.—Called by the Canarese "*Hassru Muligay*." It appears to be common, as all the *sampwallahs* had one or more on show. When poisoning preparatory to striking, the neck is much compressed, and at the same time the throat pouched, but there is no bowing of the vertebral region as in the last two snakes.

Date.	Sex.	Length.	Tail.	Ventrals.	Subcaudals.	SCALES.			REMARKS.
						2 heads-lengths after head.	Midbody.	2 heads-lengths before vent.	
Sept.									
5th	♀	179	146	15	15	11	The last ventral divided.
7th	♀	2' 5 $\frac{1}{4}$ "'	10 $\frac{3}{4}$ "'	185	158	15	15	11	Contained a frog (<i>Rana tigrina</i>).
23rd	♂	176	169	15	15	11	

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